

AN AGRICULTURAL EMPIRE, WITH READY MADE CITIES, AWAITS COMING OF SETTLER

Population Alone Is Needed to Realize the Vision Which
Inspired the Building of a Splendid "Plant" for the Develop-
ment of Western Provinces of Canada

By S. ROY WEAVER

Toronto, March 16.

WHILE interesting differences of opinion are found among Canadians as to the extent of immigration into the Dominion after the war, there is fairly general agreement that the progress and prosperity of this country will depend in large measure upon the success of its colonization policies. The position of Canada to-day is like that of a manufacturer with a big plant, entailing heavy overhead charges, who is forced to operate at fractional capacity because of shortage of labor. Rapid and wise land settlement offers the solution of almost every great economic problem before the Canadian people at the present time.

The question is now receiving attention by the Dominion and provincial governments, working in co-operation, and it is recognized that the old haphazard and unscientific methods of securing immigrants and settling them on the land have been rendered obsolete by the war. The best thought of the nation has been devoted to the problem, and new policies are emerging. Especially will the effort be made to secure English-speaking settlers by offering them more than the inducement of ownership of homesteads, and the programmes of the several governments cannot fail to be peculiarly attractive to the farmers of the Western states of the American Republic.

It is a commonplace remark that the prosperity of the Dominion is dependent upon its annual Western crop. In these days of expanding foreign trade Canada, much more than the United States, is in danger of failing to realize the full importance of its domestic commerce. The home market must be maintained and expanded. It is good that our foreign trade in manufactures should be developed, but such foreign trade must be built upon a substantial domestic trade foundation. The latter can only be secured by the expansion of our agricultural and extractive industries. Production is the first commandment in Canada's new business creed, and the second is Thrift. Canadians are coming to see, as they have not done clearly before, that Agriculture is the parent of Manufacture, and that Trade means primarily the efficient organization and utilization of the natural resources of the Dominion.

Need of Settlers Is Imperative

The situation in the Canadian West affords an interesting proof of the imperative need of settlers. The West has suffered because it assumed excessive obligations in anticipation of a more rapid increase of population than it actually secured. For several years prior to 1914 Western Canada experienced a phenomenal influx of settlers. Conservative public programmes designed to provide for moderate growth of population proved inadequate. For a time there was waste, when public officials were cautious. The demands for services increased more rapidly than they could be met by moderate development policies. Public opinion soon insisted on big, ambitious programmes for public works, etc. The West became reckless through a desire to be truly economical. It had too much "vision."

Reaction came: it started in 1914, before there was any thought of war, except among those responsible for the world conflict, but the war did give the West a decent excuse. It is true that the international situation greatly aggravated, although it did not initiate, the collapse. There was liquidation, and it was searching, uncompromising and unsparring. The West paid the penalty for failure to observe that in the development of cities and industries dependent upon agriculture it must keep pace with, and not outrun, the settlement of its farm areas. To-day the cities of Western Canada are burdened with overhead obligations which have necessitated drastic curtailment of further capital expenditures. Reduced populations are finding the debt load very heavy, although the other costs of municipal government are being kept to a minimum.

Public ownership enterprises were popular during the boom days, and it is exceptional to find a city on the prairies west of Winnipeg which does not own at least its street railway system. Services have been much curtailed, but even with the resultant economies there are very few publicly owned utilities in the West which are not being operated at a loss.

The city of Edmonton, for exam-

ple, with a population probably not in excess of 50,000, owns its electric light and power distribution systems, its telephones, water works and street railway, the aggregate investment amounting to \$9,650,879, and the net deficit to date to nearly \$700,000. It should be said that, with very few exceptions, the publicly owned utilities of Western Canadian cities are being operated with a high degree of efficiency and economy. As population increases they will gradually become self-sustaining, and later yield considerable revenue or make possible a reduction in rates. The best proof that the franchises now held by the public are valuable, even although they are not now paying for themselves, is the fact that private interests are endeavoring to gain possession of them. Indeed, there seems to be a campaign on foot to discredit public ownership enterprises in the West, which has as its purpose to secure control of those enterprises by private companies. Population alone is needed to put these utilities on a sound economic footing.

The utility services under provincial government control are in a somewhat similar position. The prairie provinces have their own telephone systems, and although the political administration of the latter has not been above criticism, increased settlement of the areas served should overcome many of the economic difficulties. Then, too, there are the provincial universities, Alberta and Saskatchewan both have splendidly equipped institutions, and the only lack is students. The attendance was increasing until the war drained the West of so many of its young men, but it will be many years before the maximum utilization of these universities will be possible. In the mean time, the overhead charges must be provided.

Plant Equipped Magnificently

Nor are public projects alone in excess of present requirements. Comparatively small cities, such as Edmonton, Calgary, Vancouver and Victoria, all have magnificent and costly hotels, far surpassing anything in Toronto or other Ontario cities—except the Chateau Laurier, at Ottawa. They do not pay, and cannot pay for years to come, but are part of the great "plant" of the Canadian West which calls for people to enable it to operate at an increasing proportion of its capacity. Go where you will throughout the West, one marvels at the development of the cities, the improvements, the magnificent buildings, in contrast with the extent of agricultural settlement and the numbers of the agricultural population. The superstructure is imposing in proportion to the potentially great but, as yet, small agricultural base. The problem is one of enlarging that base by land settlement.

The West has suffered a very severe drain of population since the war began. Everywhere west of the Great Lakes, if the visitor inquires as to the population of any city or town he receives a reply to the effect that in the "boom" days the population was so-and-so; to-day it is not over such-and-such a figure—probably 20 per cent or more lower than the 1913 record. Edmonton, for instance, in 1914 boasted a population of 72,516. The 1915 municipal census showed 59,339. For 1916 the federal census figures of 53,794 were accepted in lieu of a count by the local authorities, because the city administration was trying to economize, but even the civic officials admit that the federal estimate is probably too high, and certainly not too low. In other cities one is told in whispers of how the population has been reduced. That reduction, however, in so far as it has occurred among the non-agricultural classes, has been a blessing, since it has served to restore a safer proportion between rural and urban population.

\$4,000,000 Unpaid Taxes in Edmonton

Some idea of the magnitude of the "boom" development is afforded by a study of the situation with which Edmonton, the capital city of the Province of Alberta, now finds itself confronted. With a population of about 50,000 people, the city could be housed comfortably within its present municipal boundaries a population of at least 3,000,000, or nearly twice the aggregate population of the three provinces of Manitoba, Alberta and Saskatchewan. Such widening of the city's limits, with the extension of services which was involved, is responsible for the financial condition of Edmonton to-day. Unpaid

taxes now amount to \$4,000,000, or nearly one and a half times the total tax levy in 1916. Interest, sinking fund and redemption fund charges in connection with the city's debt last year required nearly one-third of all the taxes collected. Single tax, which has been depended upon for several years, is to be abandoned, and the city is contemplating an application to the provincial Legislature to be freed from the obligation of providing sinking fund and depreciation appropriations for its public utilities. The city feels that it can pay out of current revenue for the upkeep of those utilities and meet the interest charges, but that, under present conditions, it should not be required to pay off any part of the principal as well. The situation in other Western cities differs from that in Edmonton only in degree.

The collapse was felt most severely where the advance had been most pronounced. Prices of many commodities were reduced in some cases by one-half or even more. Houses which, in the "boom" days, rented for \$45 or more per month are offered to tenants to-day for \$20 to \$25. It is the same story all over the West. Many cases could be cited of rents which to-day are only one-third and in some instances but one-fourth of those paid during 1913. The war augmented the reaction after the "boom," but it also paved the way for a revival of prosperity. At the first call for men to join the colors there was gathered into the army a very large proportion of those who had lost their jobs. The workless enlisted in hundreds and even thousands, and that explains, to some extent at least, the very noticeable lack of English-speaking laborers in the West to-day. In part, the shortage has been met with Oriental labor

and manual workers drawn from the very large foreign element west of the Great Lakes.

Western Canada to-day is on a safer development basis than it has been at any previous time in the last decade. It is making a splendid recovery from the depression which left its people chastened and wiser but still intensely optimistic and enthusiastic about the future of the vast country west of Winnipeg. The West has few munitions plants, but it has felt the stimulus of war prices for agricultural products. High-priced wheat has been the dynamic factor in stimulating trade and improving general business conditions. Labor has been scarce. The crop is considerably below the average and only about one-half the yield last year. But war prices have more than counterbalanced these handicaps in most parts of the West. The farmers to-day have money, and they are spending it with a free hand.

Everywhere, in fact, there is evidence of prosperity and of easy, reckless expenditure. The West is growing rich on the war quite as much as the East. There is little thought of the future, of the days when war prices for agricultural produce will no longer prevail.

It is frankly recognized that the war has had far-reaching effects, and that Canada will find much more competition for immigrants than it has had in the past. The offer of free homesteads and the inducement of ownership will no longer be sufficient to secure a large and continuous influx of settlers of a desirable type. The Dominion and the provincial governments have been warned, and they are heeding the warning, that if the Dominion is to be a successful competitor for agriculturists it must provide, in addition, facilities and social conditions as attractive as those which go with tenancy in other countries. An advanced land programme is being urged, including not only the offer of free homesteads but also attention to secure improved planning of new territory, the settlement of lands adjacent to railways and manufacturing centres before those more remote are opened to settlers, the development of village industries and provision of agreeable social conditions and cooperative facilities of various kinds. This would necessitate important changes in the present settlement policy. Business methods must be applied to the situation. The settler must be left to shift entirely for himself. There must be a closer relationship than in the past between the government and the settler.

The Chinese Money Puzzle

CHINA'S currency system is as intricate and complex to the uninitiated as the proverbial Chinese puzzle. China might well be called a nation of money changers. A stranger in the country is fairly bewildered at the varieties of money thrust at him. Silver, gold, copper, brass and paper circulate from hand to hand, at constantly shifting ratios of value. This makes it extremely troublesome for the inexperienced merchant who undertakes commercial relations with the Chinese. To smooth the path for such, George E. Anderson, the American Consul General at Hong Kong, British China, has prepared an outline of the difficulties arising from currency complications in that country, which is as interesting as it is instructive to the prospective trader with China.

The money of China and of the British colony of Hong Kong, he points out, is based, at least for larger transactions, upon silver, whose relation to gold—that is, the ordinary market price of silver in the markets of the world—determines the international value from day to day of the country's or colony's entire monetary circulation. In China proper the old standard of money was simply a tael, or Chinese ounce (1.13 ounces) of silver, together with copper or brass cash that practically never had a fixed relation to silver. In recent years most business in the open ports of China has been transacted in terms of the Mexican or Chinese silver dollar, whose value has depended upon the actual amount of silver it contained.

Currency of Many Varieties

At present in the South China trade field (Hong Kong, Canton and subsidiary ports) the currency consists of (a) the Hong Kong standard silver dollar, otherwise known as the "British dollar"; (b) Hong Kong paper currency, which is a promise from certain authorized banks to pay such standard silver dollar on demand; (c) Hong Kong subsidiary coins, including particularly 50-cent pieces, 20-cent pieces, 10-cent pieces and copper coins; (d) the Canton silver dollar, which is a comparatively rare coin; (e) the Canton paper dollar, which is a promise from the Chinese government, usually the provincial government, to pay such silver dollar on demand, but in practice redeemable in small silver coin; and (f) Chinese subsidiary coins, notably Chinese 20-cent pieces, 10-cent pieces, copper 1-cent pieces and brass cash.

It is impossible to give any fixed ratio of value between any of these

Getting World Trade by Cable

New York Export Firms
Spend Large Sums Every
Year to Keep in Close
Touch with Customers

By H. R. VOLK.

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Steel Export Company

AN INDICATION of the scale upon which the large export firms in New York are doing business abroad is furnished by the fact that some of them are paying the various cable companies for service at the rate of \$75,000 a year, notwithstanding every effort to keep down expenses by an extended use of deferred and cable letter service and of nine standard and eleven private codes. By using the private codes the cost of cabling is often reduced to a tenth of what it would be were the message sent in full. Previous to December 25, 1916, all cables to Japan were permitted with a registered address, which saves the cost of a signature. Since that date the Japanese censor has made it necessary to sign all cables with the full name of the sender, and at \$1.33 a word this materially adds to the cost of cabling.

In order to economize to the fullest extent, condensers are resorted to; by their use two expressions or sentences in a standard code can be combined in one word of ten letters. Various forms of condensers are used, some of which use the twelve figure system, which gives a great range, due to the greater number of figures it gives. Of course, this can be condensed into a word of ten letters which complies with the cable companies' regulations governing full rate code messages.

Use of Private Codes Effects Big Saving

With the use of private codes, which often take years of painstaking effort to compile, it is possible to condense into one word the name of your customer, the material wanted, full specifications, months in which the goods are to be shipped and the prices.

By the larger export companies a special cable department is maintained under the direction of an ex-

port clerk, familiar with all the details of transmitting messages by cable and in constant touch with new developments. The present regulations and restrictions in regard to cable codes require considerable care in the matter of the cable text itself and especially the address, in order to avoid delay or refusal. As an example, when cabling to Spain, the censor will not permit the text to be written in anything but plain English or French. It would naturally be assumed that Spanish would be permitted to a country where Spanish is the national language, but such is not the censor's ruling.

Very strict regulations apply to all cables to Europe. The same regulations that apply to Great Britain are in force in all British possessions and great care has to be exercised that the full address and signature is on all cables. For instance, if one were cabling to Bathurst, British West Africa, the cost is \$1.03 a word. If the address was insufficient you are notified by the censor and a service charge of one word is made, besides all necessary words to complete the address. If six words were necessary the additional cost would be \$6.18. Of course, this would have been charged in the first place had the cable been properly addressed, but the most serious part is the annoying and costly delay.

Quick Thinking Means Economy

It is necessary to keep a library of the various codes used, together with a list of the customers' cable addresses and the various codes they use. Standardized forms facilitate transmission and the computing and checking of charges. The cable clerk must also know exactly the time of day in all the principal cities so that he can say whether a cable will reach a certain point during business hours, or whether a deferred or week end rate could not be used instead. At Denver, for example, the clock is an hour slower than New York, at San Francisco three hours, at Yokohama ten, at Hong Kong eleven. At Rio de Janeiro, however, it is two hours faster than New York; at London five, at Rome six, at Petrograd seven, at Bombay ten.

In these days it takes quick thinking in order to save time and keep down expenses, and it has in several instances become necessary in order to reach a nearby point speedily yet economically to cable right around the world. For instance, when the deferred service was suspended via Pacific and a long cable, which because of its technical nature could not be put into code, was to be sent to Australia, the route selected was from New York to Gibraltar via London, and on through Suez to Sydney. The answer, of only a few words, continued the trip around the world, coming at the full rate via San Francisco to New York, and was duly delivered at the American Steel Export Company offices, an all wire route of 30,000 miles.

All this is possible through the splendid system and cooperation of the American cable companies. Their courteous and competent employees aid very materially in the fast and accurate service furnished the subscriber. As an instance of this, in connection with the sending of an Asiatic cable, it was received by the cable receiver with the sender's full name as a signature. Knowing that this was an error, as the cable carried a registered address which does away with the signature, the cable man erased the signature, dispatched the cable and notified the sender of the error. This saved some very valuable time.

Looking into the future, there is one thought that strikes home with the greatest force. Just think what it will mean to the world's business when the supermarine, transcontinental, globe girdling telephone is developed to the point of commercial application.

Bars Foreigners from Water Power

Norway Proposes to Retain Control of Such Resources

A special committee of the Norwegian Storting has recommended that concessions for the acquisition of waterfalls shall not be granted to foreigners or foreign companies except in exceptional cases, as when, for instance, a going concern is desirous of obtaining possession of or regulating a waterfall.

For Norwegian citizens a concession is to be necessary in cases of waterfalls capable of yielding more than 5,000 natural horsepower. The capital of companies or syndicates wishing to secure such concessions must be exclusively Norwegian, and they must be domiciled in Norway and have an entirely Norwegian board of directors. The duration of the concessions is to be limited to sixty years. The state is to be entitled to acquire the waterfall at latest in the fortieth year after the granting of the concession. Its option of purchase applies to waterfalls above 5,000 horsepower, while for smaller ones the option rests with the corporation or municipality. The amount of power to be ceded in the state and the grant of the concession is to be a concession is to be 5 per cent.

American Goods Imported

At a Profit from China
Considerable quantities of American piece goods, it is reported, have been bought in Shanghai, China, and shipped to the United States at a profit. Some of these goods had been in China for a number of years and were bought for much less than it would cost to replace them.

SCIENCE BREAKING GERMANY'S NATURAL CORNER IN POTASH

Mineral Much Needed by Farmers for
Fertilizer Is Now Obtained from Blast
Furnaces as By-Product of Pig Iron

THE importance of potash to plant growth is realized by all scientific agriculturists, and also doubtless by the majority of farmers in this country. However, for the benefit of those readers whose training has been along other lines it may be stated that potash is an essential mineral constituent of nearly all plant life. It would be practically impossible to raise crops of grain, such as corn, wheat, etc., upon which the very life of the nation depends, upon soil destitute of this fertilizing mineral substance.

Fortunately, Nature has provided a sufficient amount of potash in available form in nearly all virgin soils for the growth of standard crops. But too often, by injudicious crop rotation, and without returning sufficient potash and perhaps other fertilizing materials to the soil, once fertile lands have become barren. The great number of unproductive farms, especially through the Eastern portion of the United States, bear sad witness to this practice.

Furthermore, Nature has stored up quantities of insoluble potash as a constituent form of common clay, feldspar and other minerals, which, however, is rendered only very slowly available as plant food by weather action. Numerous metallurgical methods have been developed for converting this potash into a form in which plants may absorb it, but so far the costs of such processes have been prohibitive.

Prior to the European war practically the entire amount of potash salts, amounting to over 1,000,000 tons per annum, consumed in this country were imported from Germany, where, chiefly at Stassfurt, wonderful deposits of soluble salts occur. The great majority of this material was consumed in the fertilizer industry. With the outbreak of the war these imports, of course, were cut off, and the farmers have been hard pressed to obtain supplies.

As a result, a great deal of scientific research has been conducted to find domestic sources of potash fertilizer, of reasonable cost and of sufficient quantity to satisfy the country's need. The government, through the Bureau of Mines, is now active in this investigation. Hitherto waste products, such as beet sugar and molasses residues, containing appreciable amounts of potash are now being reclaimed. An industry is being established along the California coast for recovering from the sea and burning giant kelp, the ashes of which are rich in potash. A mineral known as alunite is now being worked in Utah, and potash recovered as one of the two or three useful components. Certain dry alkaline lake beds in the West promise eventually to be producers of potash, though thus far little reclamation actually has been inaugurated.

The above and certain other small sources of supply by no means have satisfied the normal demand for potash in the United States, and the result has been soaring prices, the present market value being several times the pre-war-time quotations.

A By-Product of
Blast Furnaces
The statement that potash may be reclaimed as a by-product from the blast furnace producing pig iron may seem anomalous to the average mind. One could not well imagine materials or industries more unrelated than pig iron and fertilizer. Yet this combination of products may now be found in several blast furnace plants in the Eastern United States, thus far in a rather small way, though the dual industry promises to become increasingly important in the future. At one large plant the problem has been investigated with considerable thoroughness, and a resume of the research and the results obtained may be of interest.

The principal materials charged into a blast furnace, ore, coke and limestone, all carry small amounts of potash, chiefly in admixed felspar or clay. Calculated on the basis of pig iron produced, it was found at the plant above mentioned that an average of about twenty pounds of potash (potassium oxide) was charged into the furnaces for each ton of pig iron produced. From a metallurgical standpoint the behavior of potash in a blast furnace is peculiar. As the ore, coke and stone slowly travel down into the furnace the intense heat in the hearth volatilizes the potash, which is carried by the ascending current of gas back toward the top of the furnace. Part of it is condensed in the cooler upper portion of the furnace and is again carried down, probably circulating several times. Some of it is flushed out of the furnace hearth as a constituent part of the slag, analyses showing the

average amount lost in this manner to be about 20 per cent of the total potash charged.

Practically all of the remaining potash is carried out of the top of the furnace by the gas current in the form of an exceedingly fine fume. The gas (about 140,000 cubic feet per ton of pig iron), which is valuable as a fuel, is led down from the top of the furnace in steel mains through a dust catcher, which removes the coarser particles of ore, coke, etc., carried over mechanically by the gas current; thence through a primary wet washing plant which removes most of the remaining dirt; then it is sub-divided by appropriate mains and delivered to stoves, boilers and a part through secondary washers to gas engines. The stoves, of which there is a battery of four or five per furnace, are enormous steel shells, practically cylindrical in shape, partially filled with a mass of checker brick, which the gas, after burning, pre-heats in two or three vertical passes. After a stove has been heated for a sufficient time the gas is cut off, and the air blast is passed through in the reverse direction, thus being pre-heated on its way to the furnace.

The fine potash-bearing fume, leaving the top of the furnace in the gas current, passes through the dust catcher, where only a small amount is deposited, due to its fineness, and into the primary wet washers, where the greater part at present is washed out and lost.

However, a considerable amount is carried forward into the stoves and boiler settings, where much of it deposits at the bottoms of the passes. Periodically this material, which is in the form of a fine, light gray or yellowish powder, is removed, loaded in bulk in cars and sold as fertilizer. It will average about 10 per cent water soluble potash content, and is in admirable condition for direct use as fertilizer, unless the dealers wish to dilute it with a lower grade product with inert substance or by admixture with other fertilizing materials.

Electricity Promises
To Solve Problem
Although many carloads of such potash-bearing dust have been recovered annually for the last few years at the plant previously referred to, and a lesser number from certain other plants, the amount actually reclaimed has been shown to be only about 2 per cent of the total charged into the blast furnace. About 10 or 12 per cent escapes through the stoves and boiler house stacks as a white fume of insupportable fineness. It was found by calculation that about 55 per cent of the potash was lost by solution in the primary wet washers.

However, within the last few years an electrical method for the precipitation of fine dust particles has been developed, which promises eventually to solve the problem of recovering this dust on a large scale. Preliminary tests have shown that blast furnace dust can be precipitated almost perfectly by this method.

A few points of scientific importance may also be of popular interest. In contact with hot coke in the furnace, potash tends to form potassium cyanide, a deadly poison. This compound is nearly always decomposed before escaping from the furnace, though occasionally it is carried over by the gas current. At instance is on record where some flue dust containing cyanide from a blast furnace in Styria was dumped into a river, and a great quantity of fish was killed. The flue dust which is collected in the stove and boiler settings is so impalpable that when examined under a microscope it is up to 3,000 magnification some particles are still almost invisible. This fine fume, when in sufficient quantity, has the peculiar property of restricting the combustion of the gas under the boilers, sometimes extinguishing the flame completely. It also attacks the brick work in the stoves, tending to erode and flake it. Any method of reclaiming all this dust will simultaneously increase the value of the by-product and improve the furnace operation.

After the war it is practically certain that shipment of potash-bearing salts from Germany will be resumed. The present high prices will consequently be lowered. However, it has been shown that the blast furnace is a heavy producer of potash. Processes for reclaiming a relatively small portion at practically no expense are now in operation at a number of plants, and doubtless will continue. Methods for a much greater recovery have already proved successful on a small scale, and doubtless will be developed in the future; hence the blast furnace promises to augment the national resources as a potash producer.